WHAT IS CLAIMED IS:

1. An electron optical system having a plurality of electron lenses, comprising:

a plurality of electrodes which have apertures for transmitting a charged-particle beam and are arranged in one plane; and

a shield interposed between said adjacent electrodes.

2. The system according to claim 1, wherein said shield is arranged substantially parallel to an optical axis.

3. The system according to claim 1, wherein the apertures are circular.

4. The system according to claim 1, wherein the apertures are rectangular.

5. The system according to claim 1, wherein

the electron optical system comprises at least two sets of said plurality of electrodes, and

said at least two sets of said plurality of electrodes are arranged along an optical axis.

6. The system according to claim 1, wherein each of said plurality of electrodes has a plurality of apertures.

7. An electron optical system having a plurality of electron lenses, comprising:

an upper electrode having a plurality of apertures;

a plurality of middle electrodes each having an aperture;

a lower electrode having a plurality of apertures; and

a shield interposed between said adjacent middle electrodes,

wherein said upper electrode, middle electrodes, and lower electrode are arranged along an optical axis.

8. The system according to claim 7, wherein said shield is electrically coupled to said upper and lower electrodes.

9. The system according to claim 8, wherein said shield is electrically insulated from middle electrodes on two sides of said shield.

10. The system according to claim 7, wherein said shield is arranged substantially parallel to the optical axis.

11. The system according to claim 7, wherein

the electron optical system comprises at least two sets of said plurality of middle electrodes, and

said at least two sets of said plurality of middle electrodes are arranged along the optical axis.

12. The system according to claim 7, wherein the apertures of said upper electrode, the apertures of said middle electrodes, and the apertures of said lower electrode are circular.

13. The system according to claim 7, wherein the

apertures of said upper electrode, the apertures of said middle electrodes, and the apertures of said lower electrode are rectangular.

14. The system according to claim 13, wherein each of said middle electrodes has a plurality of rectangular apertures, and a long side of each aperture has an angle of not less than 0° to less than 180° in a direction along which the plurality of apertures are aligned.

15. An electron optical system having a plurality of electron lenses, comprising:

a first electron optical system array having electrodes with a plurality of rectangular apertures; and

a second electron optical system array having electrodes with a plurality of rectangular apertures, said first and second electron optical system arrays being arranged along an optical axis,

wherein a long side of each aperture of said first electron optical system array is perpendicular to a long side of each aperture of said second electron optical system array.

16. The system according to claim 15, wherein each of said first and second electron optical system arrays comprises:

an upper electrode having a plurality of apertures;

a plurality of middle electrodes each having an aperture;

a lower electrode having a plurality of apertures; and

a shield interposed between said adjacent middle electrodes.

17. A charged-particle beam exposure apparatus comprising:

a charged-particle source for emitting a charged-particle beam;

a first electron optical system which has a plurality of electron lenses and forms a plurality of intermediate images of said charged-particle source by the plurality of electron lenses; and

a second electron optical system for projecting on a substrate the plurality of intermediate images formed by said first electron optical system,

said first electron optical system including:

a plurality of electrodes which have apertures for transmitting the charged-particle beam and are arranged in one plane; and

a shield interposed between said adjacent electrodes.

18. A charged-particle beam exposure apparatus comprising:

a charged-particle source for emitting a charged-particle beam;

a first electron optical system which has a plurality of electron lenses and forms a plurality of intermediate images of said charged-particle source by the plurality of electron lenses; and

a second electron optical system for projecting on a substrate the plurality of intermediate images formed by said first electron optical system,

said first electron optical system including:

an upper electrode having a plurality of apertures;

a plurality of middle electrodes each having an aperture;

a lower electrode having a plurality of apertures; and

a shield interposed between said adjacent middle electrodes,

wherein said upper electrode, middle electrodes, and lower electrode are arranged along an optical axis.

19. A charged-particle beam exposure apparatus comprising:

a charged-particle source for emitting a charged-particle beam;

a first electron optical system which has a plurality of electron lenses and forms a plurality of intermediate images of said charged-particle source by the plurality of electron lenses; and

a second electron optical system for projecting

on a substrate the plurality of intermediate images formed by said first electron optical system,

said first electron optical system including:

a first electron optical system array having electrodes with a plurality of rectangular apertures; and

a second electron optical system array having electrodes with a plurality of rectangular apertures, said first and second electron optical system arrays being arranged along an optical axis,

wherein a long side of each aperture of said first electron optical system array is perpendicular to a long side of each aperture of said second electron optical system array.

20. A device manufacturing method comprising the steps of:

installing a plurality of semiconductor manufacturing apparatuses including a charged-particle beam exposure apparatus in a factory; and

manufacturing a semiconductor device by using the plurality of semiconductor manufacturing apparatuses,

the charged-particle beam exposure apparatus having:

a charged-particle source for emitting a charged-particle beam;

a first electron optical system which has a plurality of electron lenses and forms a plurality of

intermediate images of the charged-particle source by the plurality of electron lenses; and

a second electron optical system for projecting on a substrate the plurality of intermediate images formed by the first electron optical system,

the first electron optical system including:

a plurality of electrodes which have apertures for transmitting the charged-particle beam and are arranged in one plane; and

a shield interposed between the adjacent electrodes.

21. The method according to claim 20, further comprising the steps of:

connecting the plurality of semiconductor manufacturing apparatuses by a local area network;

connecting the local area network to an external network of the factory;

acquiring information about the charged-particle beam exposure apparatus from a database on the external network by using the local area network and the external network; and

controlling the charged-particle beam exposure apparatus on the basis of the acquired information.

22. A semiconductor manufacturing factory comprising:

a plurality of semiconductor manufacturing apparatuses including a charged-particle beam exposure apparatus;

a local area network for connecting said plurality of semiconductor manufacturing apparatuses; and

a gateway for connecting the local area network to an external network of said semiconductor manufacturing factory,

said charged-particle beam exposure apparatus having:

a charged-particle source for emitting a charged-particle beam;

a first electron optical system which has a plurality of electron lenses and forms a plurality of intermediate images of the charged-particle source by the plurality of electron lenses; and

a second electron optical system for projecting on a substrate the plurality of intermediate images formed by said first electron optical system,

said first electron optical system including:

a plurality of electrodes which have apertures for transmitting the charged-particle beam and are arranged in one plane; and

a shield interposed between said adjacent electrodes.

23. A maintenance method for a charged-particle beam exposure apparatus, comprising the steps of:

preparing a database for storing information about maintenance of the charged-particle beam exposure

apparatus on an external network of a factory where the charged-particle beam exposure apparatus is installed;

connecting the charged-particle beam exposure apparatus to a local area network in the factory; and

maintaining the charged-particle beam exposure apparatus on the basis of the information stored in the database by using the external network and the local area network,

the charged-particle beam exposure apparatus having:

a charged-particle source for emitting a charged-particle beam;

a first electron optical system which has a plurality of electron lenses and forms a plurality of intermediate images of the charged-particle source by the plurality of electron lenses; and

a second electron optical system for projecting on a substrate the plurality of intermediate images formed by the first electron optical system,

the first electron optical system including:

a plurality of electrodes which have apertures for transmitting the charged-particle beam and are arranged in one plane; and

a shield interposed between the adjacent electrodes.